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## Heuristics & Biases Simplified: Easy to Understand One-Pagers that Use Plain Language & Examples to Simplify Human Judgement and Decision-Making Concepts

Brittany Gullone

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The final capstone research project for the Master of Behavioral and Decision Sciences is an independent study experience. The paper is expected to:

- Present a position that is unique, original and directly applies to the student's experience;
- Use primary sources or apply to a primary organization/agency;
- Conform to the style and format of excellent academic writing;
- Analyze empirical research data that is collected by the student or that has already been collected; and
- Allow the student to demonstrate the competencies gained in the master's program.

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# Heuristics & Biases Simplified: Easy to Understand One-Pagers that Use Plain Language & Examples to Simplify Human Judgement and Decision-Making Concepts

## Abstract

Behavioral Science is a new and quickly growing field of study that has found ways of capturing readers' attention across a variety of industries. The popularity of this field has led to a wealth of terms, concepts, and materials that describe human behavior and decision making. Many of these resources are lengthy and complex and thus, may stand in the way of sharing knowledge. The intent of this document is to simplify a few key heuristics and biases. This will help the audience quickly and effectively communicate with others less familiar with these concepts. Each one-pager will highlight one concept with the following components: 1) The definition using plain language 2) Real-world examples observed 3) Effective behavioral interventions 4) Additional resources for further learning.

This document is NOT a comprehensive list of all heuristics, biases, or behavioral science concepts, nor does it capture all of the research, applications, or interventions to date. If effective, this document will serve as a quick reference guide or an introductory resource to a variety of audiences. This "bite-size" and high-level approach is intended to be easy to digest and captivating -consuming the least amount of readers' time and cognitive effort possible.

## Disciplines

Social and Behavioral Sciences

## Comments

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# Heuristics & Biases Simplified

EASY TO UNDERSTAND ONE-PAGERS THAT USE PLAIN LANGUAGE & EXAMPLES  
TO SIMPLIFY HUMAN JUDGEMENT AND DECISION-MAKING CONCEPTS

BRITTANY GULLONE ALTONJI, JULY 2019

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## INTRODUCTION

Behavioral Science is a new and quickly growing field of study that has found ways of capturing readers' attention across a variety of industries. The popularity of this field has led to a wealth of terms, concepts, and materials that describe human behavior and decision making. Many of these resources are lengthy and complex and thus, may stand in the way of sharing knowledge.

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- 1) The **definition** using plain language
- 2) **Real-world examples** observed
- 3) Effective behavioral **interventions**
- 4) **Additional resources** for further learning

This document is NOT a comprehensive list of all heuristics, biases, or behavioral science concepts, nor does it capture all of the research, applications, or interventions to date. If effective, this document will serve as a quick reference guide or an introductory resource to a variety of audiences. This “bite-size” and high-level approach is intended to be easy to digest and captivating - consuming the least amount of readers' time and cognitive effort possible.

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*Brittany G. Altonji's work on this document was presented as an independent study capstone to complete the University of Pennsylvania's Master of Behavioral and Decision Sciences degree program in August of 2019.*

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## ACKNOWLEDGEMENTS

NAME	ROLE
Dr. Edward Royzman	Capstone Reader & Professor
Dr. Christopher Nave	Program Advisor

# REPRESENTATIVENESS

## DEFINITION

“The subjective probability of an event, or a sample, is determined by the degree to which it: (i) is similar in essential characteristics to its parent population; and (ii) reflects the salient features of the process by which it is generated,” (Kahneman & Tversky, 1972).

**Meaning ...** *our brain tries to find an answer based on similarities to a stereotype rather than considering the true likelihood using simple probabilities.*

## REAL WORLD EXAMPLES

- 1) In the **lottery**, people prefer “random” number sequences (i.e. 27, 13, 34) to “patterned” sequences (i.e. 10, 20, 30) though they have the same statistical likelihood (Krawczyk & Rachubik, 2019)
- 2) **Nurses** are often biased by contextual information (i.e. patient lost his/her job) which causes them to overlook/misattribute physiological symptoms (Brannon & Carson, 2003)
- 3) In **home inspections**, inspectors will often make judgements on the quality of the entire structure based on a small sample to speed up the process (Sprinkle, 2019)

## INTERVENTION(S)

- Be aware and cautious of irrelevant information (**defensive**)
- Refresh your knowledge of basic statistics (**defensive**)
- To make something attractive, make it similar to something else attractive (**offensive**)

## FURTHER READING

PAPER	AUTHOR(S)	DATE
Representativeness revisited: Attribute substitution in intuitive judgment	Daniel Kahneman & Shane Frederick	August 2001
Insider trading, representativeness heuristic insider, and market regulation	Hong Liu, Lina Qi, & Zaili Li	January 2019

# ANCHORING

## DEFINITION

“In many situations, people make estimates by starting from an initial value that is adjusted to yield the final answer. The initial value, or starting point, may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient. That is, different starting points yield different estimates, which are biased toward the initial values. We call this phenomenon anchoring,” (Tversky & Kahneman, 1974).

*Meaning ... we gravitate to the first number (or impression) we hear. Even though we may make small adjustments, we will still end closer to that number (or impression) than we otherwise would have.*

## REAL WORLD EXAMPLES

- 1) In **negotiations**, research strongly supports that final negotiation outcomes end up in favor of (closer to) the party that make the more aggressive first offer
- 2) In **real-estate**, a higher asking price is likely to result in a higher final settlement price (Aycock, 2000)
- 3) People often misestimate **time**. If you first do a shorter (longer) task, you are more likely to estimate that the second task is shorter (longer) than it really is (Thomas & Handley, 2008)

## INTERVENTION(S)

- Re-anchor by countering an extreme number with an equally extreme counter (**defensive**)
- Make the first offer in negotiations, more extreme than your actual goal (**offensive**)

## FURTHER READING

PAPER	AUTHOR(S)	DATE
A Literature Review of the Anchoring Effect	Adrian Furnham & Hua Chu Boo	February 2011
First Offers as Anchors	Adam Galinsky & Thomas Mussweiler	October 2001
Measures of Anchoring in Estimation Tasks	Karen E. Jacowitz & Daniel Kahneman	November 1995

# AVAILABILITY

## DEFINITION

“The availability of instances or scenarios is often employed when people are asked to assess the frequency of a class or the plausibility of a particular development,” (Tversky & Kahneman, 1974).

Meaning ... *if an example comes to mind easily, we think it is more common or more likely to occur than if it comes to mind less easily.*

## REAL WORLD EXAMPLES

- 1) **Doctors** are more likely to diagnose a patient with a certain condition if they had a recent encounter with that condition (Poses & Anthony, 1991)
- 2) People are more likely to purchase natural disaster **insurance** after they experience a natural disaster rather than before (Karlsson, Loewenstein, & Ariely, 2008)
- 3) Students who completed course **evaluations** requiring 10 critical comments rated the course more favorably than those who had been asked for 2 critical comments (Fox, 2006)

## INTERVENTION(S)

- Seek neutral sources of news and media outlets (**defensive**)
- Research real statistical likelihoods before making a decision (**defensive**)
- Increase the frequency, strength, and recognizability of your brand (**offensive**)

## FURTHER READING

PAPER	AUTHOR(S)	DATE
The availability heuristic and perceived risk	Valerie S. Folkes	June 1988
The effect of imagining an event on expectations for the event: An interpretation in terms of the availability heuristic	John S. Carroll	January 1978
The availability heuristic, intuitive cost-benefit analysis, and climate change	Cass R. Sustein	July 2006

# AFFECT HEURISTIC

## DEFINITION

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“Reliance feelings that are rapid and automatic based on the specific quality of “goodness” or “badness” (i) experienced as a feeling state (with or without consciousness) and (ii) demarcating a positive or negative quality of a stimulus,” (Slovic et al., 2007).

Meaning ... *when we have to make a quick decision, we use our feelings as our guide.*

## REAL WORLD EXAMPLES

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- 1) Holding pricing, service, and amenities equal, consumers differentiated their preference amongst Las Vegas **hotels** based on emotions (Ro et al, 2013)
- 2) People who are shown pictures of flooded homes are more likely to consider flooding a true risk – affect is important in effective **risk communication** (Keller et al., 2006)
- 3) Consumer evaluations of **innovative products** are biased based on their positive or negative feelings as they interact with the product (King & Slovic, 2014)

## INTERVENTION(S)

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- Be aware of your emotional reaction and take mitigating steps to ensure it does not cloud your decision making (**defensive**)
- Create positive feelings when people interact with your brand to boost its image (**offensive**)

## FURTHER READING

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PAPER	AUTHOR(S)	DATE
The Affect Heuristic	Paul Slovic et al.	March 2007
Risk perception and affect. Current directions in psychological science	Paul Slovic & Ellen Peters	December 2006
Ideals and oughts and the reliance on affect versus substance in persuasion	Michel Tuan Pham & Tamar Avnet	March 2004



# PEAK & END EFFECT

## DEFINITION

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“Rather than objectively reviewing the total amount of pleasure or pain during an experience, people's evaluation is shaped by the most intense moment (the peak) and the final moment (end),” (Cockburn et al., 2015).

Meaning ... *All is well that ends well.*

## REAL WORLD EXAMPLES

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- 1) In **childbirth**, the level of pain toward the end of delivery greatly influences the way the entire experience is remembered (Chajut et al., 2014)
- 2) The best predictor of an **employee's quitting a job** is the instances of negative peaks and end during their employment (Clark & Georgellis, 2006)
- 3) In **service industries**, highest customer satisfaction is reported in interactions that have positive peak experiences and positive endings (Verhoef et al., 2004)
- 4) **Gamblers** who received peaks of winnings and ended with a win evaluated their experiences more favorably than those with consistent small winnings (Yu et al., 2008)

## INTERVENTION(S)

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- When recalling events, give equal weight to all instances; keep a journal and reference all entries before making an overall evaluation (**defensive**)
  - Ensure your customers or patients experience positive ending interactions (**offensive**)
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## FURTHER READING

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PAPER	AUTHOR(S)	DATE
When more pain is preferred to less: Adding a better end	Kahneman et al.	November 1993
Peak-end effects on player experience in casual games	Gutwin et al.	May 2016
Does the peak-end phenomenon observed in laboratory pain studies apply to real-world pain in rheumatoid arthritis?	Stone et al.	January 2000

# SOCIAL PROOF / REFERENCE

## DEFINITION

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“Using the actions of others to infer the value of a course of action,” (Rao et al., 2001).

Meaning ... *When we don't know what to do, we do what we see others doing*

## REAL WORLD EXAMPLES

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- 1) In **online shopping**, ratings and reviews shape reputation and thus, drive demand (Ambler & Bui, 2014)
- 2) **Securities analysts** are quick to initiate coverage of a firm when peers have recently begun coverage, and subsequently overestimate the firm's future profitability (Rao et al., 2001)
- 3) When asking for **charitable donations**, volunteer solicitors find that more people donate when they see others donating (Shearman & Yoo, 2007)
- 4) In **supermarkets**, healthy consumer choices are influenced by signage stating that it is the most sold item in the store (Salmon et al., 2015)

## INTERVENTION(S)

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- Seek out multiple sources of independent evaluations before making a decision (**defensive**)
- Leverage the power and momentum of positive reviews on social media (**offensive**)
- In marketing, influence consumer behavior by informing them of the majority behavior of other consumers (**offensive**)

## FURTHER READING

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PAPER	AUTHOR(S)	DATE
Compliance with a Request in Two Cultures: The Differential Influence of Social Proof and Commitment/Consistency on Collectivists and Individualists	Cialdini et al	October 1999
Influence: The psychology of persuasion	Cialdini	July 1993
Using social marketing to enhance hotel reuse programs	Shang et al.	February 2010

# OMISSION BIAS

## DEFINITION

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“People often evaluate a decision to commit an action more negatively than a decision to omit an action, given that both decisions have the same negative consequence,” (Kordes-de Vaal, 1996).

*Meaning ... we feel better if we do nothing and something bad happens, rather than if we actively do something bad.*

## REAL WORLD EXAMPLES

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- 1) **Reluctance to vaccinate children** when the (unlikely) negative effects are ambiguous or unknown (Ritov & Baron, 1990)
- 2) Because people are susceptible to omission bias, **counter-terrorism** efforts have increased marketing and training that encourages action (Van den Heuvel & Crego, 2012)
- 3) In **stock market returns**, investors punish firms that have violations by commission (i.e. repeat violations) more severely than those with violations by omission (Wiles et al., 2010)
- 4) **Pilots** with lower internal sense of accountability related to performance, will rely on automatic systems and take less action thus committing more errors than pilots with a higher sense of personal accountability (Mosier et al., 1998)

## INTERVENTION(S)

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- Reinforce the importance of accountability, honesty, and speaking up (**defensive**)
- In negotiations, detect others' deception by asking direct questions multiple times while looking for inconsistencies in responses (**defensive**)

## FURTHER READING

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PAPER	AUTHOR(S)	DATE
Omission and commission in judgment and choice	Mark Spranka et al.	January 1991
Regulatory focus as a predictor of omission bias in moral judgment: Mediating role of anticipated regrets	Eun Chung et al.	September 2014

# NEGATIVITY BIAS

## DEFINITION

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“Negative information tends to influence evaluations more strongly than comparably extreme positive information.”

*Meaning ... losses (or negative information) make us feel much worse than similar sized gains (or positive information) make us happy.*

## REAL WORLD EXAMPLES

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- 1) The more negative information is, the more **people believe it is true** (Hilbig, 2009)
- 2) When collecting **qualitative survey responses**, dissatisfied employees are much more likely to leave negative comments than their satisfied peers (Poncheri, 2007)
- 3) People are more **incentivized** by the fear of a loss (negative framing) rather than the chance to accrue a gain (positive framing) (Goldsmith & Dhar, 2013)

## INTERVENTION(S)

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- Increase optimism and more equality evaluate positive and negative stimuli through the practice of mindfulness (**defensive**) (Kiken & Shook, 2011)
- In older adults, limited attentional resources tend to be drawn to negative stimuli – increasing focus will mitigate this distraction (**defensive**) (Knight et al., 2007)

## FURTHER READING

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PAPER	AUTHOR(S)	DATE
Negativity bias, negativity dominance, and contagion	Paul Rozin & Edward Royzman	November 2001
‘Negativity bias’ in risk for depression and anxiety: Brain–body fear circuitry correlates, 5-HTT-LPR and early life stress	Leanne Williams et al.	September 2009
The sky is falling: evidence of a negativity bias in the social transmission of information	Keely Bebbington et al.	January 2017

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